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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,598	09/28/2006	Hirohiko Matsushita	4633-0187PUS1	6837

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FALLS CHURCH, VA 22040-0747

EXAMINER
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WALBERG, TERESA J

ART UNIT	PAPER NUMBER
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3744

NOTIFICATION DATE	DELIVERY MODE
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08/05/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,598	<b>Applicant(s)</b> MATSUSHITA ET AL.	
	<b>Examiner</b> Teresa J. Walberg	<b>Art Unit</b> 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 April 2009 has been entered.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent claims 1 and 5 the phrase "the adsorbent layer selects the binder" is not understandable; possibly it is an incorrect translation from a foreign document.

Based on the specification, it appears that the claims should say that the material of the binder and the concentration of the adsorbent in the adsorbent layer are selected so that a linear thermal expansion coefficient of the adsorbent layer is substantially equivalent to a linear thermal expansion coefficient of the fins, and that the linear thermal expansion coefficient of the fins is between the

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linear thermal expansion coefficient of the binder and the linear thermal expansion coefficient of the adsorbent used in the adsorbent layer.

It has been assumed for purposes of this office action that the above statement is how the claims were intended to be interpreted. Correction is required.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-18, to the extent understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Maier-Laxhuber et al (5,585,145) in view of Takahashi et al (6,346,298).

Maier-Laxhuber et al disclose a heat exchanger (Fig. 1) having the claimed structure including a plurality of fins (3), an adsorbent (4) capable of adsorbing moisture from the air and desorbing the moisture into the air, the adsorbent being a zeolite (col. 2, lines 55-56), the surfaces of the fins (3) being covered with an adsorbent layer (4) containing the adsorbent and a binder (col. 2, lines 50-54) for supporting the adsorbent on the surfaces of the fins (Fig. 1), the adsorbent layer being configured to follow thermal expansion or contraction

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of the fins caused by temperature change without falling off the fins (col. 4, lines 8-13, and col. 2, lines 9-27).

Maier-Laxhuber et al does not appear to specify that the fins have a greater thermal expansion coefficient than the adsorbent. However, since the fins and the adsorbent are made of substantially the same materials as in the present application they can be presumed to have these same properties.

Maier-Laxhuber et al also does not state that the binder has a thermal expansion coefficient greater than that of the fins. However, Maier-Laxhuber et al states at col. 2, lines 11-14 that the materials used are intended to solve the prior art problem of the adsorbent bed coating delaminating from the fins due to differences in expansion coefficients. Since in Maier-Laxhuber et al the thermal expansion coefficients of the fins and the adsorbent bed are apparently approximately the same, the binder would necessarily have a higher thermal expansion coefficient.

Maier-Laxhuber et al does not specify that the binder is an organic water based emulsion binder including urethane resin, an acrylic resin, or an ethylene-vinyl acetate copolymer, the thickness and thermal conductivity of the adsorbent layer, the fin pitch, and the air velocity. However, organic water based emulsion binders including urethane resin, acrylic resin, and ethylene-vinyl acetate copolymer are conventional in the art for use as binders and adhesives. It would have been obvious to one of ordinary skill in the art to use urethane resin, acrylic resin, or ethylene-vinyl acetate copolymer as the adhesive in the layers of Maier-

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Laxhuber et al, since Maier-Laxhuber et al leaves it to one of ordinary skill in the art to determine what adhesive should be used.

It would have been obvious to one of ordinary skill in the art to use any desired thickness and thermal conductivity of the absorbent layer, fin pitch, and air velocity in the heat exchanger of Maier-Laxhuber et al, based on the intended use of the device.

Maier-Laxhuber et al does not disclose the mass ratio between the adsorbent and the binder being varied in the different layers in the thickness direction.

Takahashi et al teaches varying the composition of different layers to match a thermal expansion coefficient of a base layer in a first layer and to have gradually decreasing thermal expansion coefficients in subsequent layers.

It would have been obvious in view of Takahashi et al to vary the compositions of the layers of Maier-Laxhuber et al to vary the thermal expansion coefficients as taught by Takahashi et al, the motivation being to prevent damage to the device by differences in thermal expansion.

While Takahashi et al does not state that the thermal expansion coefficient of the first resin is being substantially equivalent to the thermal expansion coefficient of the foil layer. However, Takahashi et al teaches selecting the thermal expansion coefficient of the first resin layer to be only slightly greater than that of the foil layer and to be less than that of the outer resin layers. Thus the thermal expansion coefficient of the first resin layer is considered to be

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substantially equivalent to the thermal expansion coefficient of the foil layer, since it has an expansion coefficient closer to that of the foil layer than the other layers do.

6. Applicant's arguments filed 24 May 2009 have been fully considered but they are not persuasive.

Applicant argues that the references do not show the amended limitation of "the adsorbent layer selects the binder". However, this phrase is not understood by the examiner. Clarification is requested if the intended meaning is not as interpreted above.

Applicant argues that Takahashi does not teach the specific relationships between the thermal expansion coefficients of the layers. However, Takahashi is considered to teach selecting the thermal expansion coefficient of the first resin layer to be only slightly greater than that of the foil layer and to be less than that of the outer resin layers, as stated above.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa J. Walberg whose telephone number is 571-272-4790. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Teresa J. Walberg/  
Primary Examiner, Art Unit 3744

/TW/